

Remarks

Reconsideration and withdrawal of the objection and rejections set forth in the above-mentioned Official Action in view of the foregoing amendments and the following remarks are respectfully requested.

Claims 1-9 and 15-21 are now pending, with Claims 1 and 20 being independent. Claims 1, 3-8, 15 and 16 have been amended and Claims 19-21 have been added herein.

Applicants note with appreciation the indication that Claims 6 and 7 recite allowable subject matter. These claims were objected to for being dependent upon rejected base claims. However, these claims will not be rewritten in independent form at this time because independent Claim 1 is believed to be allowable for the reasons discussed below.

Claims 1-5, 9 and 15-18 were rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 5,053,790 (Stephenson et al.) in view of European Patent Application No. 0 642 925 (Schantz). Claim 8 was rejected under § 103 as being unpatentable in further view of U.S. Patent No. 4,982,199 (Dunn). These rejections are respectfully traversed.

As is recited in independent Claim 1, the present invention relates to a printing apparatus which performs printing by moving a carriage unit, capable of holding a printhead having a plurality of heater resistances, over a print medium based on information transmitted by an external apparatus. The apparatus includes reception means and a voltage control unit. The reception means receives an information signal, related to a property of the heater resistances, transmitted from the printhead. The voltage control unit

adjusts a voltage generated in the printing apparatus to drive the printhead based on the information signal received by the reception means. The voltage control unit is provided on the carriage unit.

As is recited in independent Claim 20, the present invention relates to a combination of a print head and a printing apparatus which performs printing by moving a carriage unit, capable of holding the printhead having a plurality of heater resistances, over a print medium based on information transmitted by an external apparatus. The printhead includes a switching device and a detection resistance. The switching device controls each of the plurality of heater resistances. The detection resistance has a property corresponding to a resistance property of the heater resistances. The printing apparatus includes a voltage control unit that adjusts a driving voltage generated in the printing apparatus. The detection resistance is manufactured by the same semiconductor deposition process as the heater resistances, and the voltage control unit is provided on the carriage unit.

Support for the amendments to Claim 1 can be found in the original specification at least at page 22, lines 12-23 and in the description of Fig. 3. Claim 6 has been amended to clarify the compared voltages and is supported by the inputs to amplifier 7 in Fig. 3. Support for new Claims 19-21 can be found at least at page 22, lines 12-23; page 25, lines 14-21; and page 24, line 17 to page 25, line 2 as well as Fig. 3, respectively. Of course, the claims are not intended to be limited in scope to these preferred embodiments.

Stephenson et al. describes a thermal printhead in which a voltage coupled to the printhead is adjusted responsive to the sensed number of selected heat elements to

maintain a constant predetermined voltage across the selected heat elements independent of the number of selected heat elements. As understood by Applicants, Stephenson et al. also discloses a configuration in which a voltage is adjusted based on temperature information measured by a thermal sensing device 506.

However, Stephenson et al. does not disclose or suggest at least adjusting a voltage to drive a printhead based on an information signal, related to a property of heater resistances, transmitted from the printhead, as is recited in independent Claim 1. Nor does Stephenson et al. disclose or suggest that the voltage control circuit is provided on a carriage unit, as is further recited in independent Claim 1.

In addition, Stephenson et al. does not disclose or suggest at least a printhead having detection resistance having a property corresponding to a resistance property of heater resistances of the printhead, with the detection resistance being manufactured by the same semiconductor deposition process as the heater resistances, as is recited in newly-presented independent Claim 20. Also, as with Claim 1, Stephenson et al. does not disclose that the voltage control unit is provided on the carriage unit, as is further recited in Claim 20.

Thus, Stephenson et al. fails to disclose or suggest important features of the present invention recited in independent Claims 1 and 20.

The ink jet printhead of Schantz is described as having electrical connections. A circuit for power supply is provided on a carriage. This circuit is a power-conditioning circuit that stabilizes an unstable voltage outputted from a battery and outputs the stabilized voltage. There is no disclosure or suggestion in Schantz of adjusting a

voltage generated in a printing apparatus to drive a printhead based on an information signal, related to a property of heater resistances, transmitted from the printhead. Nor does Schantz disclose or suggest a detection resistance that is manufactured by the same semiconductor deposition process as heater resistances. Accordingly, Schantz is not believed to remedy the deficiencies of Stephenson et al. noted above with respect to the independent claims.

Dunn relates to an ink jet method and apparatus for gray scale printing that utilize two pulses to eject each ink droplet. There is no disclosure of adjusting a voltage to drive a printhead based on an information signal related to a property of heater resistances and transmitted from a printhead, or of a detection resistance and its method of manufacture. Dunn, therefore, also fails to remedy the deficiencies of the citations noted above with respect to the independent claims.

Thus, independent Claims 1 and 20 are patentable over the citations of record. Reconsideration and withdrawal of the § 103 rejections are respectfully requested.

For the foregoing reasons, Applicants respectfully submit that the present invention is patentably defined by independent Claims 1 and 20. Dependent Claims 2-9, 15-19 and 21 are also allowable, in their own right, for defining features of the present invention in addition to those recited in their respective independent claims. Individual consideration of the dependent claims is requested.

Applicants submit that the present application is in condition for allowance. Favorable reconsideration, withdrawal of the objection and rejections set forth in the above-noted Office Action, and an early Notice of Allowability are requested.

Applicants' undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,



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